

What is claimed is:

1. A press for forming a capacitor element from valve powder comprising:
walls forming an elongated compression chamber of uniform section having openings at its opposite ends,
a set of opposed rib punches extending through said openings and linearly reciprocable in said chamber a first distance between a non compacting position and a compacting position,
a set of opposed channel punches linearly reciprocable in said chamber a second distance between a non compacting position and a compacting position,
said opposed sets of rib and channel punches being interleaved,
first drive means operable to move said rib punches between their non-compaction position and their compaction position at a first predetermined speed,
second drive means operable to move said channel punches between their non-compaction position and their compaction position at a second predetermined speed,
the ratio of said first predetermined speed to said second predetermined speed being equal to the ratio of said first distance to said second distance, and
controls operable to cause said first and second drive means to simultaneously move said rib and channel punches from their non-compacting positions to their compacting positions.
2. The press of claim 1 wherein said controls for said first and second drive means are operable to cause said second drive means to move said channel punches from their compacting position to their non-compacting position and subsequently cause said first drive

means to move said rib punches from their compacting position to their non-compacting position.

3. The press of claim 1 wherein the ratio of the linear distance between said opposed rib punches in their non-compacting position to the linear distance between said opposed rib punches in their compacting position being the same as the ratio of the linear distance between said opposed channel punches in their non-compacting position to the linear distance between said channel punches in their compacting position.

4. The press of claim 3 wherein said controls for said first and second drive means are operable to cause said second drive means to move said channel punches from their compacting position to their non-compacting position and subsequently cause said first drive means to move said rib punches from their compacting position to their non-compacting position.

5. The press of claim 1 wherein said set of rib punches includes three rib punches in opposed alignment with three other rib punches, and wherein said set of channel punches include two channel punches in opposed alignment with two other channel punches.

6. The press of claim 5 wherein said punches are interleaved plates.

7. The press of claim 1 wherein a contiguous pair of said walls are shiftable away from the other walls thereby facilitating removal of a capacitor element formed in said press without burnishing contact with said walls.

8. A press for forming a capacitor element from valve powder comprising:
a stationary support having a flat horizontal upward facing surface,
a pair of parallel side walls of equal height resting on and extending upwardly from said upward facing surface of said support,

said side walls presenting confronting parallel vertical surfaces a predetermined distance apart and coplanar top surfaces parallel to said flat horizontal surface of said support,

a removable top wall having a flat surface in engagement with said top surface of said side walls,

said upward facing surface of said support, said confronting vertical surfaces of said side walls and said flat surface of said top wall defining an elongated horizontally extending compression chamber of quadrilateral section having openings at its opposite ends,

a set of opposed rib punches extending through said chamber openings shiftable horizontally toward and away from one another in the elongated direction of said chamber between a powder loading position and a compacting position,

a set of opposed channel punches extending through said chamber openings shiftable horizontally toward and away from one another in the elongated direction of said chamber between a powder loading position and a compacting position, said rib and channel punches being interleaved,

the ratio of the linear distance between said opposed rib punches in their loading position to the linear distance between said opposed rib punches in their compacting position being the same as the ratio of the linear distance between said opposed channel punches in their loading position to the linear distance between said channel punches in their compacting position, and

actuator means operable to simultaneously move said rib and channel punches from their loading position to their compacting position.

9. The press of claim 8 wherein said actuator means moves said rib and channel punches at speeds producing a uniform rate of compression of said powder throughout said element.

10. The press of claim 8 wherein at least one of said side walls is shiftable away from the other side wall to facilitate removal of an element formed in said press.

11. A press for forming a capacitor element from valve powder comprising:
vertical walls forming a vertically elongated compression chamber of uniform quadrilateral section and having top and bottom openings,

a set of opposed upper and lower rib punches vertically reciprocable in said chamber,

a set of opposed upper and lower channel punches vertically receprocable in said chamber,

said upper rib punches being interleaved with said upper channel punches,

said lower rib punches being interleaved with said lower channel punches, and

drive means connected to said punches operable to position said punches in a powder loading position in which said upper rib and channel punches are positioned a predetermined distance above said top opening and said lower rib and channel punches extend through said bottom opening,

said drive means being operable to move said rib and channel punches from said powder loading position to a precompression position and to simultaneously move said upper and lower rib and channel punches from said precompression positions to element forming compression positions at speeds proportional to the distances said rib and channel punches travel

in moving from their precompression positions to their compression positions, whereby said element is uniformly compacted.

12. The press of claim 11 having four side walls defining a compression chamber having a rectangular cross section and wherein an adjacent pair of said side walls are movable to facilitate removal of a capacitor element formed by said press.

13. The press of claim 11 wherein said drive means is operable to sequentially retract said channel punches and said rib punches from their compaction position.

14. A method of making a capacitor element with opposed indentations in its laterally opposite sides defining ribs and channels, comprising the steps of:

providing a press with a compression chamber, a set of opposed rib punches, a set of opposed channel punches interleaved with said rib punches shiftable between non-compaction and compaction positions, and power means operable to move said punches between said non-compacting and compacting positions,

the ratio of the distance between said opposed rib punches in their non-compacting position to the distance between said opposed rib punches in their compacting position being equal to the ratio of the distance between said opposed channel punches in their non-compacting position to the distance between said channel punches in their compacting position,

using said power means to position said opposed rib punches and said opposed channel punches in their non-compacting position,

filling said chamber with valve metal powder,

using said power means to compress said valve metal powder to form a capacitor element by simultaneously moving said channel punches and said rib punches from their non-

compacting positions to their compacting positions at speeds proportional to said ratio distances they move in forming said element, and

using said power means to retract said punches from their compacting positions to their non-compacting position.

15. The method of claim 14 in which said channel punches are retracted before said rib punches during the step of retracting said punches.

16. A method of making a capacitor element having opposed indentations in its laterally opposite sides defining ribs, oppositely disposed channels and at least one web between said oppositely disposed channels comprising the steps of:

providing a compression chamber,

placing a predetermined amount of valve powder in said compression chamber,

compacting said powder with interleaved sets of opposed rib and channel punches to form said ribs and channels by moving said punches from non-compacting positions to compacting position producing the same degree of compaction in said ribs as in said web between said channels and

withdrawing said punches.

17. The method of claim 16 in which said channel punches are withdrawn from said capacitor element prior to withdrawal of said rib punches.

18. The method of claim 17 wherein the ratio of the distance between said rib punches in their non-compacting position to the distance between said rib punches in their compacting position is the same as the ratio of the distances between said channel punches in their non-compacting position to the distance between said channel punches in their compacting position.

19. The method of claim 18 wherein said rib and channel punches move at speeds during compaction to produce a uniform rate of compaction of said powder in said ribs and said web of said element.